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QUIZZES

Practice Test-1 (Chromosomes and DNA)



10 Questions



7 min

Topics

Chromosomes (Number, Structure, Composition and Organization), Concept of gene, DNA as heredity material

SAEED MDCAT

Start Quiz

SAEED MDCAT TEAM



SAEEDMDCAT



1/10



7 min



Hint

Q : Chromosomes may vary in:

A

Their size

B

Staining properties

C

Location of centromere

D

All A, B, C

SAEED MDCAT

SAEED MDCAT TEAM



SAEEDMDCAT

1

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6

7



2/10



7 min



Hint

Q : Which of the following option is correct with respect to the chemical composition of chromosomes?

A

40% proteins and 60% DNA

B

40% DNA and 60% proteins

C

50% of each DNA and proteins

D

20% DNA and 80% proteins

SAEED MDCAT

SAEED MDCAT TEAM



SAEEDMDCAT

1

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6

7



3/10



7 min



Hint

Q : Nucleosome consists of:

A

Complex of 200 nucleotides and 8 histones molecules

B

Complex of 400 nucleotide pairs and 8 histones molecules

C

Complex of 100 nucleotides and Variable histones molecules

D

Complex of variable nucleotides and Variable histones molecules

SAEED MDCAT

SAEED MDCAT TEAM



SAEEDMDCAT

1

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7



4/10



7 min



Hint

Q : Histones are positively charged due to the abundance of:

A

Acidic amino acids

B

Aromatic amino acids

C

Basic amino acids

D

Non-polar and neutral amino acids

SAEED MDCAT

SAEED MDCAT TEAM



SAEEDMDCAT

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7



5/10



7 min



Hint

Q : Highly condensed portion of the chromatin is:

A

Euchromatin

B

Satellite DNA

C

Heterochromatin

D

Chromatin fiber

SAEED MDCAT

SAEED MDCAT TEAM



SAEEDMDCAT

1

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7



6/10



7 min



Hint

Q : The particular place of the chromosome where a gene is located is called:

A

Elementen

B

Heredity factor

C

Locus

D

Transposons

SAEED MDCAT**SAEED MDCAT TEAM****SAEEDMDCAT**

1

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7



7/10



7 min



Hint

Q : The amount of DNA in a diploid cell is:

A

Variable for a given species

B

Constant for a given species

C

Same in all species of plants

D

Same in all species of animals

SAEED MDCAT

SAEED MDCAT TEAM



SAEEDMDCAT

1

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6

7



8/10



7 min



Hint

Q : The carbohydrate component of nucleic acid is:

A

Hexose

B

Pentose

C

Heptose

D

Triose

SAEED MDCAT

SAEED MDCAT TEAM



SAEEDMDCAT

4

5

6

7

8

9

10



9/10



7 min



Hint

Q : If the % of adenine in ds-DNA molecule is 20%, then the % of guanine is:

A

80%

B

20%

C

30%

D

40%

SAEED MDCAT

SAEED MDCAT TEAM



SAEEDMDCAT

4

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8

9

10

Q X-Ray diffraction pattern of DNA was first prepared by

- ☐ A Watson and Crick
- ☐ B Rosalind Franklin
- ☐ C Erwin Chargaff
- ☐ D Maurice Wilkins

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SAEED MDCAT TEAM

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Q Chromosomes may vary in

- ☒ A Their size
- ☐ B Staining properties
- ☐ C Location of centromere

☒ D All A, B, C

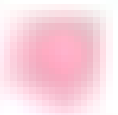
Explanation

Chromosomes may widely differ in appearance. They vary in size, staining properties, the location of centromere, relative lengths of the two arms on either side of chromosomes and the position of constricted regions along with the arms.



Correct

Incorrect



Wrong



Q Which of the following option is correct with respect to the chemical composition of chromosomes?



40% proteins and 60% DNA



40% DNA and 60% proteins



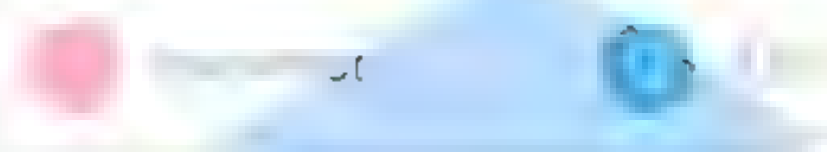
50% of each DNA and proteins



20% DNA and 80% proteins

Explanation

Mostly Chromosomes are composed of 40% DNA and 60% proteins
A significant amount of RNA is also associated with the chromosomes



Q Nucleosome consists of



Complex of 200 nucleotides and 8 histones molecules



Complex of 400 nucleotide pairs and 8 histones molecules



Complex of 100 nucleotides and Variable histones molecules



Complex of variable nucleotides and Variable histones molecules

Explanation

Nucleosome is the structural unit of a eukaryotic chromosome, consisting of a length of DNA coiled around a core of histones. Every 200 nucleotides, the DNA duplex are coiled around a core of eight histone proteins.



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Q Histones are positively charged due to the abundance of



Acidic amino acids



Aromatic amino acids



Basic amino acids



Non-polar and neutral amino acids

Explanation

Histones are positively charged due to the abundance of basic amino acids like arginine and lysine.



reco

not condensed



condensed



Q Highly condensed portion of the chromatins



Euchromatin



Satellite DNA



Heterochromatin



Chromatin fiber

Explanation

Heterochromatin has condensed chromatin structure and is inactive for transcription, while euchromatin has loose chromatin structure and is active for transcription.



Rec

not recorded



ut



Q The particular place of the chromosome where a gene is located is called



Elementen



Heredity factor



LOCUS



Transposons

Explanation

In genetics, a **locus** is a specific, fixed position on a chromosome where a particular gene or genetic marker is located



Correct

Incorrect



Incorrect

Q The amount of DNA in a diploid cell is



Variable for a given species



Constant for a given species



Same in all species of plants



Same in all species of animals

Explanation

As all organisms of one species have same number of chromosomes in them (46 in all humans) so their DNA amount is almost same in all diploid cells of body

Incorrect



8/10

Q The carbohydrate component of nucleic acid is



Hexose



Pentose



Heptose



Triose

Explanation

Nucleic acids includes DNA and RNA which are the polymers of nucleotides. Each of the nucleotides further composed of three main components which are,

- Nitrogenous base
- Pentose sugar
- Phosphate group/s

Q If the % of adenine in ds-DNA molecule is 20% then the % of guanine is

☐ 80%

☐ 20%

☒ 30%

☐ 40%

Explanation

E. Chargaff showed that the amount of adenine in DNA is always equal to the amount of thymine and the amount of guanine is always equal to the amount of cytosine. It also implies that there is a way equal proportion of purines (A+G) and pyrimidines (C+T).



Correct

Incorrect



Wrong Answer



Q X-Ray diffraction pattern of DNA was first prepared by



Watson and Crick



Rosalind Franklin



Erwin Chargaff



Maurice Wilkins

Explanation

Rosalind Franklin's X-ray diffraction patterns of DNA molecules rendered the important clue that DNA has the structure of a double helix.

QUIZZES

Practice Test-2 (Chromosomes and DNA)

AVAILABLE AT

SAEED MDCAT TEAM

SAEEDMDCAT



10



7 hr



1 hr

Q DNA replication is best explained by which of the following hypotheses?



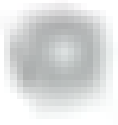
Conservative replication



Sem-conservative replication



Dispersive replication



Sem-dispersive replication

SAEED MDCAT

SAEED MDCAT TEAM



SAEEDMDCAT



2

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7

Q Most widely accepted mode for DNA replication is

- ☐ A Conservative
- ☐ B Semi conservative
- ☒ C Modified conservative
- ☐ D Dispersive

SAEED MDCAT

SAEED MDCAT TEAM

SAEEDMDCAT



70

7 min

100

Q The chemical used by Meselson and Stahl to create density gradients



NaCl



SiC



CsCl



CaCl₂

SAEED MDCAT

SAEED MDCAT TEAM

SAEEDMDCAT

1

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/ic



7 min

1.1k

Q If the length of a prokaryotic DNA strand is 20000 base pairs. How much time will DNA polymerase take to thread through it?



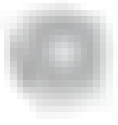
5 seconds



10 seconds



15 seconds

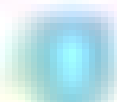


20 seconds

SAEED MDCAT

SAEED MDCAT TEAM

SAEEDMDCAT



Q Length of Okazaki fragments in prokaryotes is

- ☐ A 100-200 nucleotides
- ☐ B 1000-3000 nucleotides
- ☐ C 1000-2000 nucleotides
- ☐ D 200-300 nucleotides

SAEED MDCAT

SAEED MDCAT TEAM

SAEEDMDCAT

Q DNA replication model presented by Watson and Crick is

- ☐ A Conservative replication
- ☐ B Semi-conservative replication
- ☐ C Dispersive replication
- ☐ D Scale mode

SAEED MDCAT

SAEED MDCAT TEAM

SAEEDMDCAT



/s

7m

1.1

Q DNA double helix is opened by



Primase



DNA polymerase



Helicase



Ligase

SAEED MDCAT

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 SAEEDMDCAT



Q DNA replication occurs in _____ part/parts of a eukaryotic cell

☐ Mitochondria

☐ Nucleus

☐ Chloroplast

☒ All A, B, C

SAEED MDCAT

SAEED MDCAT TEAM

SAEEDMDCAT

Q What is the fate of primer after DNA replication?

- ☐ A Remains as such
- ☐ B Replaced by RNA nucleotides
- ☒ C Replaced by DNA nucleotides
- ☐ D Permanently degraded

SAEED MDCAT

SAEED MDCAT TEAM

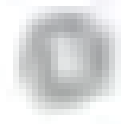
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Q The true *E. coli* replicating enzyme is DNA polymerase



A



B



C



D

SAEED MDCAT

SAEED MDCAT TEAM

SAEEDMDCAT





Rec

not recorded



Q



A

Q DNA replication is best explained by which of the following hypotheses?



Conservative replication



Sem-conservative replication



Dispersive replication



Semi-dispersive replication

Explanation

DNA replication process involves unwinding or unzipping of duplex and then simply adding complementary nucleotides on the single stranded templates



Q Most widely accepted mode for DNA replication is



Conservative



Sem conservative



Modified conservative



Dispersive

Explanation

SAEED MEDCAT TEAM



unattempted

Incorrect

3/1

Q The chemical used by Meselson and Stahl to create density gradient is



NaCl



SiC



CsCl



CaCl₂

Explanation

- The chemical used by Meselson and Stahl to create density gradient was CsCl
- SiC needles are used to create holes in the egg cell during vortex mixing method
- CaCl₂ is used to enhance the uptake of recombinant DNA by the competent bacteria



Question



Answer

Q If the length of a prokaryotic DNA strand is 20000 base pairs. How much time will DNA polymerase take to thread through it?



5 seconds



10 seconds



15 seconds



20 seconds

Explanation

The speed of polymerization of DNA pol II is 1000 nucleotides per second



Free

Material



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Q Length of Okazaki fragments in prokaryotes is



100-200 nucleotides



1000-3000 nucleotides



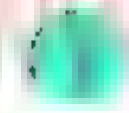
1000-2000 nucleotides



200-300 nucleotides

Explanation

Each fragment on lagging strand of prokaryotes has 1000 to 2000 nucleotides.



Rec

not recorded



Not recorded



Q DNA replication model presented by Watson and Crick is



Conservative replication



Sem-conservative replication



Dispersive replication



Scale mode

Explanation

According to Watson and Crick DNA replicates by Sem conservative replication. The sequence of the original duplex is conserved after one round of replication, the duplex itself is not.

Q DNA double helix is opened by

- ☐ Primase
- ☐ DNA polymerase
- ☒ Helicase
- ☐ Ligase

Explanation





Correct

Not Correct



Just



Q DNA replication occurs in _____ part parts of a eukaryotic cell



Mitochondria



Nucleus



Chloroplast



All A, B, C

Explanation

All are self-replicating organelles



Q What is the fate of primer after DNA replication?

- ☐ Remains as such
- ☐ Replaced by RNA nucleotides
- ☒ Replaced by DNA nucleotides
- ☐ Permanently degraded

Explanation

These RNA primers are converted into DNA strands by DNA polymerase I



sec

rate of rep



replicating



is

Q The true *E. coli* replicating enzyme is DNA polymerase



II



I



V

Explanation

The true *E. coli* replicating enzyme is DNA polymerase II, which is 10 times larger. Rate of replication is 1000 nucleotides / sec

QUIZZES

Practice Test-3 (Chromosomes and DNA)

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Q Amino acid binds with tRNA at

- ☒ Anticodon site
- ☐ 3' end
- ☐ Recognition site
- ☐ 5' end

SAEED MDCAT

SAEED MDCAT TEAM

SAEEDMDCAT



1/10



7 min



100

Q Which of the following RNA is involved in protein synthesis?



mRNA



rRNA



tRNA



All A, B, C

SAEED MDCAT

SAEED MDCAT TEAM

SAEEDMDCAT





Q During transcription, RNA polymerase binds at

- ☐ A Replication fork
- ☐ B Start codon
- ☒ C Primer site
- ☐ D Promoter site



SAEED



MDCAT

TEAM

Q During transcription, the termination of mRNA synthesis is done by?



Anticodon



Stop codon



Stop sequence



Release factor

SAEED MDCAT

SAEED MDCAT TEAM

SAEEDMDCAT



Q In bacterial cell AGA codon specifies

- ☐ Methionine
- ☒ Isoleucine
- ☐ Tryptophan
- ☐ Arginine



70

7000

100

Q The codon AUG has dual function as it codes for ____ and also acts as a ____ codon



Phenylalanine, Initiator



Methionine, regulator



Methionine terminator



Methionine, Initiator

SAEED MDCAT

SAEED MDCAT TEAM

SAEEDMDCAT





/s

7 mr

to a

Q Non sense codons on mRNA are recognized by



tRNA with anticodons



Release factors



Initiation factors



Elongation factors

SAEED MDCAT

SAEED MDCAT TEAM

SAEEDMDCAT



/ic

7 mr

td

Q The formation of peptide bond between two adjacent amino acids during translation in mitochondria is catalyzed by



30 S subunit



40 S subunit



50 S subunit



60 S subunit

SAEED MDCAT

SAEED MDCAT TEAM

SAEEDMDCAT





70



7 min

100

Q Point mutations can be the result of



DNA replication



Addition of gene



Deletion of a part of chromosome



Presence of Aneuploidy

SAEED MDCAT

SAEED MDCAT TEAM

SAEEDMDCAT

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10



Q13



7 min



100

Q Which amino acids found abnormally in sickle cells haemoglobin at position 6?

Glutamic acid in α chainValine in α chainGlutamic acid in β chainValine in β chain

SAEED MDCAT

SAEED MDCAT TEAM

 SAEEDMDCAT

Q Amino acid binds with tRNA at.



Anticodon site



3' end

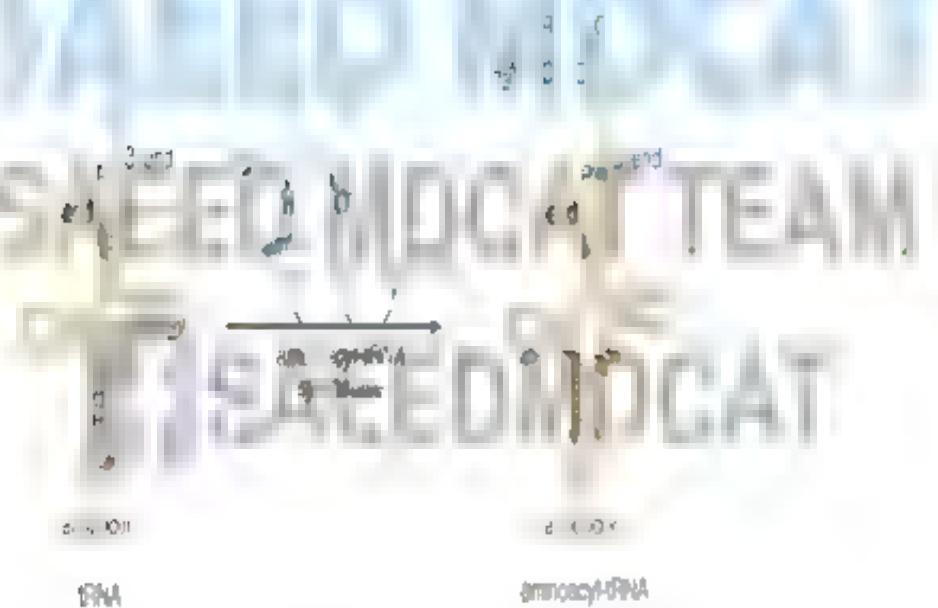


Recognition site



5' end

Explanation



Q Which of the following RNA is involved in protein synthesis?



mRNA



rRNA



tRNA



All A, B, C

Explanation

SAIEDMDCAT

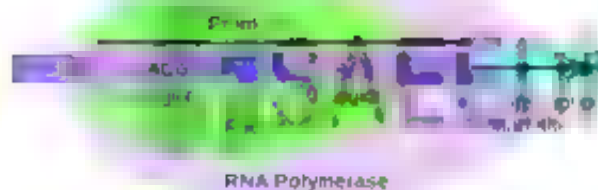
SAIEDMDCAT TEAM



Q During transcription, RNA polymerase binds at

- ☐ A Replication fork
- ☐ B Start codon
- ☐ C Primer site
- ☒ D Promoter site

Explanation





Free

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Document



File

Q During transcription, the termination of mRNA synthesis is done by?



Anti codon



Stop codon



Stop sequence



Release factor

Explanation

The termination of transcription is followed by the stop signal that is a series of GC sequence followed by series of AT sequence

Q In bacteria, ce l, AGA codon specifies

☐ Methionine

☐ Isoleucine

☐ Tryptophan

☒ Arginine

Explanation

		Second letter			
		U	C	A	G
First letter	C	Pro	His	Gln	Arg
	A	Thr	Pro	Thr	Lys
	G	Ala	Arg	Ser	Glu
	U	Phe	Leu	Ile	Met

Q • The codon ALG has dual function as it codes for ____ and also acts as a ____ codon



Phenylalanine, initiator



Methionine, regulator



Methionine terminator



Methionine, Initiator

Explanation





Correct



Unattempted



Incorrect



7/10

Q : Non sense codons on mRNA are recognized by:

A

tRNA with anticodons

B

Release factors

C

Initiation factors

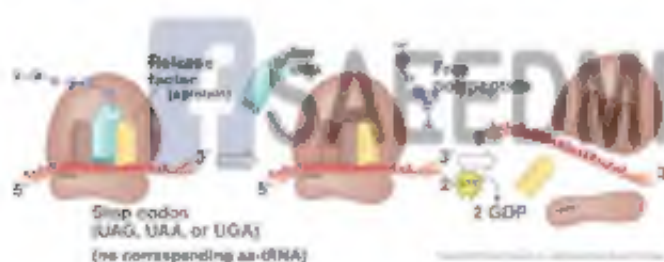
D

Elongation factors

SAEED MDCAT

Explanation

SAEED MDCAT TEAM





Correct



Unattempted



Incorrect



8/10

Q : The formation of peptide bond between two adjacent amino acids during translation in mitochondria is catalyzed by:



30 S subunit



40 S subunit



50 S subunit



60 S subunit

SAEED MDCAT TEAM

Explanation



SAEEDMDCAT

Larger sub unit of mitochondrial ribosome has peptidyltransferase enzyme that makes peptide group between amino acids and make polypeptide chain.



Correct



Unattempted



Incorrect



9/10

Q : Point mutations can be the result of:

A

DNA replication

B

Addition of gene

C

Deletion of a part of chromosome

D

Presence of Aneupliody

SAEED MDCAT

Explanation

SAEED MDCAT TEAM



SAEED MDCAT TEAM



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Incorrect



10/10

Q : Which amino acid is found abnormally in sickle cells' haemoglobin at position 6?

A

Glutamic acid in α chain

B

Valine in α chain

C

Glutamic acid in β chain

D

Valine in β chain

SAEED MDCAT

Explanation

SAEED MDCAT TEAM

